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| 10/664,972      | 09/22/2003  | Hong Sung Song       | 8733.893.00         | 4974             |

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| EXAMINER |
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LUI, DONNA V

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| ART UNIT | PAPER NUMBER |
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2629

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                    |  |
|------------------------------|--------------------------------------|------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/664,972 | <b>Applicant(s)</b><br>SONG ET AL. |  |
|                              | <b>Examiner</b><br>Donna V. Lui      | <b>Art Unit</b><br>2629            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 16-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1 and 3-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. (Pub. No.: US 2002/0030657 A1) in view of Matsushima (Pub. No.: US 2002/0057248 A1).

With respect to **Claim 1**, Kondo discloses a liquid crystal display (*See figure 8*), comprising: liquid crystal cells (*[0034], lines 13-15; [0035], lines 3-4*) arranged in a matrix defined by a plurality of gate lines and data lines (*[0034], lines 2-6*); a thin film transistor connected to the data lines in an alternating pattern based upon an arrangement of the data lines included in the liquid crystal cells (*See figure 4A, note that the upper row of TFTs (7) are positioned to the right side of the pixel electrode and the lower row of TFTs are positioned to the left side of the pixel electrode and the pattern continues for an m x n matrix in an alternating fashion; [0042], lines 8-14*); a data driver (*See figure 8, element 15a*) supplying a video signal to the liquid crystal cells and shifting the video signal by one channel to the right to drive the data lines; a pixel electrode associated with each of the liquid crystal cells (*See figure 9, note that the video signal is applied successively from left to right and therefore are shifted by one channel to the right; [0043], lines 10-12*).

Kondo does not teach an interlayer-insulation material formed by an organic insulation film having a dielectric constant less than about 4 and located between the data line and the pixel electrode associated with each of the liquid crystal cells.

Matsushima teaches an interlayer-insulation material formed by an organic insulation film having a dielectric constant less than about 4 and located between the data line and the pixel electrode associated with each of the liquid crystal cells (*See figure 2, element 25: pixel electrode, element 24: insulation film, and element 20a: data line; [0109], lines 9-11*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use an interlayer-insulation material formed by an organic insulation film having a dielectric constant less than about 4 and located between the data line and the pixel electrode associated with each of the liquid crystal cells, as taught by Matsushima, to the liquid crystal display of Kondo, so as to prevent the liquid crystal from being influenced by an electric field from the part below the insulating film, suppress a reverse tilt of the liquid crystal material and to enlarge the angle of visibility of the liquid crystal panel (*Matsushima: [0117], lines 7-11*).

With respect to **Claim 12**, claim 12 differs from claim 1 only in that the limitation “the pixel electrode having a rectangular shape” is additionally recited.

Kondo does not teach a pixel electrode having a rectangular shape.

Matsushima teaches a pixel electrode having a rectangular shape (*See figure 1, element 25*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a pixel electrode having a rectangular shape, as taught by

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Matsushima, to the liquid display panel of Kondo, so as to prevent disorder of the alignment of liquid crystal ([0138], lines 8-12; [0148], lines 6-10; note that since the picture element electrode is formed to cover the plane domain, then the shape must be rectangular since the domain consists of spacing between the gate and data electrodes).

With respect to **Claim 3**, Kondo does not teach the interlayer-insulation material includes an acryl resin.

Matsushima teaches an interlayer-insulation material includes an acryl resin ([0116], lines 3-5; [0117], lines 3-7).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use an interlayer-insulation material that includes an acryl resin, as taught by Matsushima, to the liquid crystal display of Kondo, so as to prevent the liquid crystal form being influenced by an electric field from the part below the insulating film, suppress a reverse tilt of the liquid crystal material and to enlarge the angle of visibility of the liquid crystal panel (Matsushima: [0117], lines 7-11).

With respect to **Claim 4**, Kondo does not teach the interlayer-insulation material wherein the acryl resin includes a photo acryl (P/A).

Matsushima teaches the acryl resin includes a photo acryl ([0085]).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use an interlayer-insulation material where the acryl resin includes a photo acryl, as taught by Matsushima, to the liquid crystal display of Kondo, so as to simplify the

manufacturing process and to provide excellent light transmitting characteristics ([0056]).

With respect to **Claim 5**, Kondo does not mention the pixel electrode is overlapped with more than one of the data lines adjacent thereto.

Matsushima teaches the pixel electrode is overlapped with more than one of the data lines adjacent thereto (*See figure 1, element 20: data line, element 25: pixel electrode; [0124], lines 1-2*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have pixel electrodes overlapped with more than one of the data lines adjacent thereto, as taught by Matsushima, to the liquid crystal display of Kondo, so as to increase the domain capacity for holding electric charges (*Matsushima: [0124], note that the capacity is for holding electric charges written to the source bus*).

With respect to **Claims 6 and 9**, Kondo does not teach the pixel electrode is overlapped with more than one of the gate lines formed adjacent thereto.

Matsushima teaches pixel electrodes are overlapped with more than one of the gate lines formed adjacent thereto (*See figure 1, element 16: gate line, element 25, pixel electrode; [0123], lines 8-10*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have pixel electrodes overlapped with more than one of the gate lines formed adjacent thereto, as taught by Matsushima, to the liquid crystal display of Kondo, so as to increase the domain capacity for holding electric charges (*Matsushima: [0123], last line, note*

*that the capacity is for holding electric charges written to the source bus).*

With respect to **Claims 7, 8, 10, and 11**, Kondo does not teach the pixel electrode is overlapped with the thin film transistor.

Matsushima teaches pixel electrodes are overlapped with the thin film transistor (*See figure 1, element 16a: gate electrode of TFT, element 25: pixel electrode; [0109], last three lines*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have the pixel electrodes overlapped with the thin film transistor, as taught by Matsushima, to the liquid crystal display of Kondo so as to prevent disorder of alignment of the liquid crystal (*[0138], lines 8-12; [0148], lines 6-10*).

With respect to **Claim 13**, all the claim limitations have already been discussed with respect to the rejection of claim 5.

With respect to **Claim 14**, all the claim limitations have already been discussed with respect to the rejection of claim 6.

With respect to **Claim 15**, all of the claim limitations have already been discussed with respect to the rejection of claims 5,6, and 7.

3. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo and Matsushima as applied to claim 1 above, and further in view of Yamazaki et al. (Pub. No.: US 2002/0135554 A1).

With respect to **Claim 2**, neither Kondo nor Matsushima teach the interlayer-insulation material includes a benzocyclobutene (BCB).

Yamazaki teaches an interlayer-insulation material includes a benzocyclobutene (BCB) resin film ([0322], lines 1-2).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use an interlayer-insulation material that includes benzocyclobutene, as taught by Yamazaki, to the liquid crystal display of Kondo as modified by Matsushima, so that the evenness is high, and so that an extremely effective wiring material such as copper can be used due to the low wiring resistance ([0322], lines 2-5).

#### ***Response to Arguments***

4. Applicant's arguments, see page 6, line 24 to page 7, line 9 and page 7, lines 14-23, filed August 4, 2006, with respect to the rejection(s) of claim(s) 1 and 12 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the previously applied reference, Matsushima. The examiner inadvertently cited figure 11, element 54 as the data line, when figure 2, element 20a should have been cited as the data line.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donna V. Lui whose telephone number is (571) 272-4920. The examiner can normally be reached on Monday through Friday 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Donna V Lui  
Examiner  
Art Unit 2629

AMR A. AWAD  
SUPERVISORY PATENT EXAMINER  
